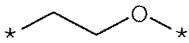


REMARKS

Claims 1-4, 6, 7, 9-11, and 14-19 are pending in the application and are at issue.

Claims 1 and 2 have been amended to recite that moiety A is C₃ to C₂₀

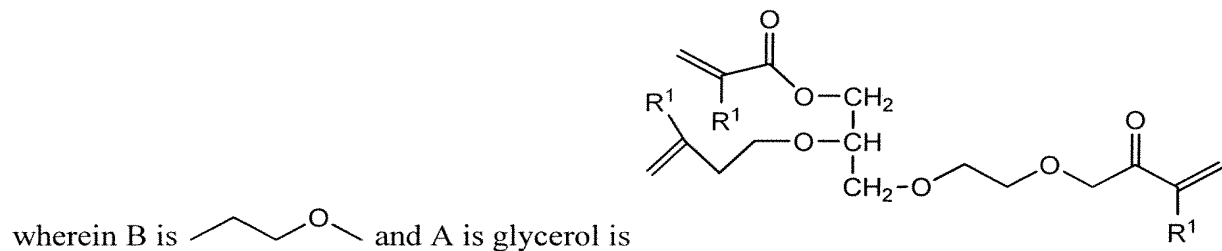
alk(n+1)yl and B is . Moiety A therefore is free of heteroatoms. In addition, one (meth)acrylate group must be bonded directly to moiety B.

The present invention therefore is directed (meth)acrylic esters of *monoalkoxylated* polyols and their use as a crosslinking agent for hydrogel-forming polymers, also termed superabsorbent polymers (SAPs). The claimed (meth)acrylic esters of monoalkoxylated polyols contain three to six (meth)acrylate groups and 1 to 100 ethoxy groups. The moiety A is free of heteroatoms. See claim 1.

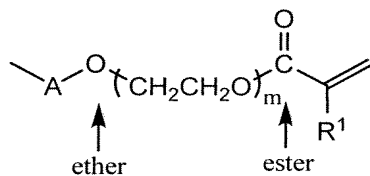
In preferred embodiments, the claimed compounds contain three or four (meth)acrylate groups and 2 to 50 ethoxy groups (claim 2). In other preferred embodiments, the claimed compounds contain three (meth)acrylate groups and 3 to 30 ethoxy groups (claim 3). In yet other preferred embodiments, the polyol is glycerol (claims 4, 10, and 11).

The claimed (meth)acrylic esters of monoalkoxylated polyols are used as crosslinking agents in the preparation of an SAP (claims 6, 7, 9, and 14-16). SAPs crosslinked with a claimed (meth)acrylic ester of a monoalkoxylated polyol exhibit a reduced percent of extractable components and a reduced centrifuge retention capacity (CRC) compared to an SAP prepared from a crosslinking agent wherein each hydroxy group of the polyol is alkoxylated, e.g., SARTOMER[®] SR9035. See specification, Comparative Example and Examples 5 and 6, at page 30, line 31 through page 32, line 34. The data shows that a present (meth)acrylic ester of a monoalkoxylate polyol exhibits superior crosslinking properties. SARTOMER[®] SR9035 is based on an ethoxylated triol wherein *each* of the three hydroxy groups of the triol is ethoxylated.

An example of a claimed (meth)acrylic ester of a *monoalkoxylated* polyol



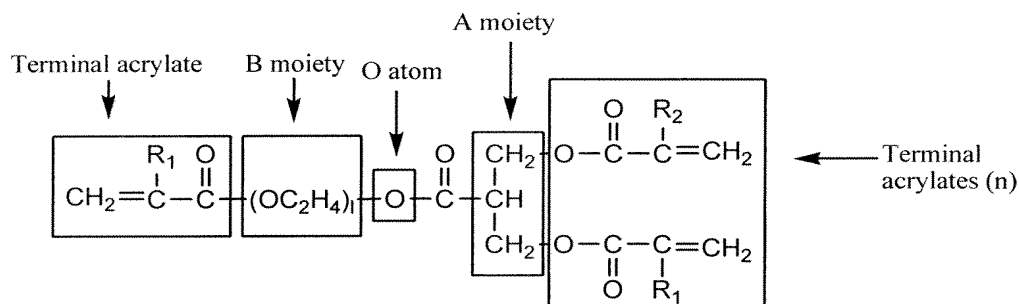
An important feature of the claimed (meth)acrylic esters is that "n" is an integer from 2 to 5 and A is C₃ to C₂₀ alk(n+1)yl. Therefore, the A moiety has one carbon atom that is *free* of a (meth) acrylate group but rather is alkoxylated with the B moiety. Another important features of the claimed (meth) acrylic ester is that one of the (meth) acrylate moieties is bonded directly to the B moiety, i.e., —CH₂CH₂O—, to provide the following structure having an ether linkage and an ester linkage:



Claim 7 is objected to because of a typographical error. Applicants have amended claim 7 to correct this error, and accordingly, the objection has been overcome and should be withdrawn.

Claim 1 stands rejected under 35 U.S.C. §102(b) as being anticipated by Takahashi et al. U.S. Patent No. 4,065,598 ('598). The rejection is based on the structure at column 3, lines 45-63 of the '598 patent.

The structure relied upon by the examiner has the following structure:



The boxes overlaying the above structure identify moieties that are common to the claimed (meth)acrylic esters (I) and the compound of the '598 patent.

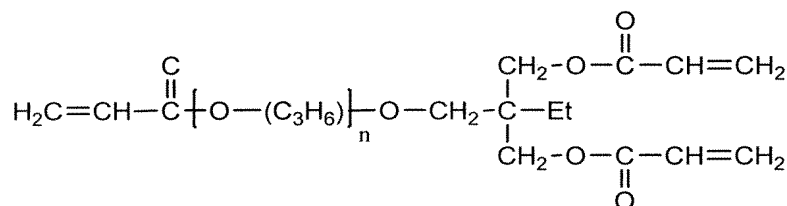
Note that the structure disclosed in the '598 patent contains an carbonyl ($\text{C}=\text{O}$) group between the oxygen atom (O) and the A moiety. This carbonyl group is absent from the presently claimed (meth)acrylic esters.

Therefore, a difference exists between the structure of claim 1 and the compound disclosed in the '598 patent such that a rejection under 35 U.S.C. §102(b) cannot be maintained. In addition, it is submitted that the difference between the (meth)acrylic esters of claim 1 and the disclosure of the '598 patent is a nonobvious difference.

In particular, the claimed structure has an ether linkage between the A moiety and the B moiety. This ether linkage is relatively nonreactive. In contrast, the linkage in the compound of the '598 patent between a corresponding A moiety and B moiety is an ester linkage. This ester linkage is significantly more reactive than, and significantly different from, the ether linkage of the claimed compounds.

The '598 patent provides no apparent reason for a person skilled in the art to substitute an ether linkage for the disclosed ester linkage. In addition, the '598 patent fails to disclose every element of the present claims. Accordingly, the (meth)acrylic esters of present claim 1 are neither anticipated by nor obvious over the compound disclosed in the '598 patent.

Claims 1-3 stand rejected under 35 U.S.C. §103 as being *prima facie* obvious over JP 62-007711 (JP '711). This rejection is based on the assertion that JP '711 discloses the following compound:



Applicants traverse this rejection.

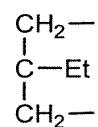
To establish a *prima facie* case of obviousness, the examiner must satisfy three requirements. First, as the U.S. Supreme Court very recently held in *KSR International Co. v. Teleflex Inc. et al.*, 127 S.Ct. 1727 (2007), "a court must ask whether the improvement is more than the predictable use of prior art elements according to their established functions. ...it [may] be necessary for a court to look to interrelated teachings of multiple patents; the effects of demands known to the design community or present in the marketplace; and the background knowledge possessed by a person having ordinary skill in the art, all in order to determine whether there was *an apparent reason* to combine the known elements in the fashion claimed by the patent at issue. ...it can be important to *identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements* in the way the claimed new invention does... because inventions in most, if not all, instances rely upon building blocks long since uncovered, and claimed discoveries almost of necessity will be combinations of what, in some sense, is already known." (emphasis added, *KSR, supra*). Second, the proposed modification of the prior art must have had a reasonable expectation of success, determined from the vantage point of the skilled artisan at the time the invention was made. *Amgen Inc. v. Chugai Pharm. Co.*, 18 USPQ2d 1016, 1023 (Fed. Cir. 1991). Lastly, the prior art references must teach or suggest all the limitations of the claims. In *re Wilson*, 165 USPQ 494, 496 (C.C.P.A. 1970).

First, applicants are unable to locate the structure relied upon by the examiner. Proceeding on the assumption that the compound relied upon by the examiner is properly disclosed in JP '711, the compound contains one or more propylene (C₃H₆) moiety and no

ethylene (C₂H₄) moieties. In contrast, the present claims are limited to B moieties having C₂H₄ groups. B moieties having C₃H₆ groups are excluded.

More importantly, the structure relied upon by the examiner differs from the claimed (meth)acrylic ester in the identity of the A moiety. The claims require an A moiety having "n" (meth)acryloyl groups plus one more carbon that is ethoxylated with the B moiety. In other words, if "n" (the number of (meth) acryloyl groups) is two, then moiety A contains three carbon atoms, i.e., alk(n+1)yl.

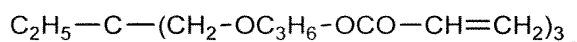
The compound relied upon by the examiner has n=2 and a C₅ A moiety, i.e.,



The A moiety of the compound relied upon by the examiner therefore is *not* alk(n+1)yl, alk(n+1)yl, but is alk(n+3)yl. This is a substantial difference in structure that effects crosslinking capabilities and the water absorption properties of an SAP.

JP '711 provides no apparent reason for a person in the art to substitute or an alk(n+1)yl for the disclosed alk(n+3)yl group or an ethylene group for the propylene group disclosed in JP '711. In addition, the examiner has failed to identify a reason that would have prompted a person of ordinary skill in the art to modify the reference in the way the claimed invention does, per the decision in *KSR*. JP '711 also fails to teach or suggest each claimed feature, i.e., a B moiety having C₂H₄ groups. Therefore, a case of *prima facie* cannot be established.

Second, at page 86, right hand column, JP '711 discloses the following compound:

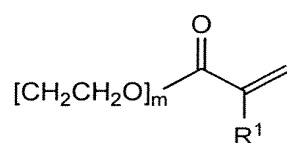


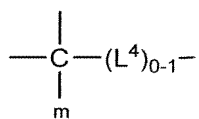
If this is the compound being relied upon by the examiner, this compound is substantially different from the compounds recited in claims 1-3. In particular, this compound also has C₃H₆ groups, not the claimed C₂H₄ groups, and has OC₃H₆ groups in each of the three acryloyl chains. The present compounds are monoalkoxylated and only one have OC₂H₄.

For all the reasons set forth above, it is submitted that claims 1-3 would not have been obvious over JP '711 and that the rejection should be withdrawn.

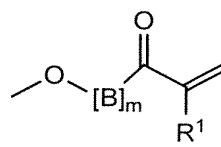
Claims 1-4, 10, and 11 stand rejected under 35 U.S.C. §103 over EP 0 490 368 (EP '368). Applicants traverse this rejection.

EP '368 discloses vinyl monomers having a polyalkylene glycol structure. However, no compound disclosed in EP '368 has a (meth)acrylate moiety attached directly to a polyethylene glycol moiety (i.e., moiety B), as presently claimed, i.e.,


$$[\text{CH}_2\text{CH}_2\text{O}]_m - \text{C}(=\text{O}) - \text{C}(\text{R}^1) = \text{CH}_2$$
 . In contrast, each (meth)acrylate moiety of EP '368 is bonded to a polyalkylene moiety via a linker



EP '368 fails to teach or suggest the modifications required to arrive at the presently claimed invention, and no apparent reason exists for a person skilled in the art to make these modifications. EP '368 fails to teach or suggest the claimed feature of


$$\text{O}-[\text{B}]_m - \text{C}(=\text{O}) - \text{C}(\text{R}^1) = \text{CH}_2$$
 , e.g., see EP '368, Table 1, 5. EP '368 also fails to teach each claimed element of the structures of claims 1-3. The examiner further has failed to identify a reason that would have prompted a person skilled in the art to modify the reference in the way the claimed invention does. Accordingly, claims 1-3 would not have been obvious over compounds of EP '368.

EP '368 discloses a glyceryl moiety, but nevertheless claims 4, 10, and 11 would not have been obvious over EP '368 for the same reasons that claims 1-3 would not have been obvious over EP '368. In summary, it is submitted that a case of *prima facie*

obviousness has not been established, and the rejection of claims 1-4, 10, and 11 in EP '368 should be withdrawn.

Claims 1-4, 6, 7, 9-11, and 14-19 stand rejected under 35 U.S.C. §103 over Hatsuda et al. U.S. Patent Publication 2002/0061978 ('978 publication) in view of EP '368. Applicants traverse this rejection.

The examiner relies upon the '978 publication for teaching a crosslinked swellable hydrogel, and asserts that it would have been obvious to utilize a compound of EP '368 as the internal crosslinking agent for swellable hydrogel. Applicants traverse this rejection.

The '978 publication discloses the standard preparation of a swellable hydrogel using long known internal crosslinking agents. EP '368 is directed to presensitized plates for lithography by reacting a silicone with the monomer disclosed in EP '368. This monomer is discussed above, as are the substantial differences between the claimed compounds and the monomers of EP '368. EP '368 also is silent with respect to utilizing the disclosed monomer as a crosslinking agent.

The most that a combination of the '978 publication and EP '368 teaches or suggests is using a monomer of EP '368 as a crosslinking agent in the preparation of a swellable hydrogel, as disclosed in the '978 publication. However, the combination of art does not teach or suggest the modification necessary to arrive at the presently claimed (meth)acrylic esters, and subsequently using the claimed (meth)acrylic ester as an internal crosslinking agent.

The nonobvious differences between the present claims and the monomers of EP '368 are discussed above, and it is submitted that in view of the nonobviousness of the claimed (meth)acrylic esters over EP '368, that it also would not have been obvious to utilize the claimed (meth)acrylic esters in the preparation of a swellable hydrogel of the '978 publication. Accordingly, the rejection of claims 1-4, 6, 7, 9-11, and 14-19 over a combination of the '978 publication and EP '368 should be withdrawn.

In summary, all pending claims are in a condition for allowance. An early and favorable action on the merits is respectfully requested.

Should the examiner wish to discuss the foregoing, or any matter of form in an effort to advance this application toward allowance, the examiner is urged to telephone the undersigned at the indicated number.

Dated: December 8, 2008

Respectfully submitted,

By 

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